



# Loïc MILLER

PhD student in Computer Science

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## About me

Hello, my name is Loïc Miller. I recently defended my PhD in Computer Science, in the Network research team at ICube. I have a great interest for security, and topics related to it. I am currently working on secure and leak-free workflows using cloud technologies, as well as policy verification techniques.

## Languages

French: Mother Tongue

English: Mother Tongue

German: Novice

## Research Interests

- Security policies
- BGP/DNS security
- Internet measurement
- Graphs
- Proofs

## Education

- 2018-2022 [PhD in Computer Science](#) University of Strasbourg  
Securing Workflows: On the Use of Microservices and Metagraphs to Prevent Data Exposures.
- 2016-2018 [Master's degree in Computer Science](#) University of Strasbourg  
Computer Networks and Embedded Systems.

## Research

- 2018 - 2022 [PhD in Computer Science](#) ICube, France  
Securing Workflows: On the Use of Microservices and Metagraphs to Prevent Data Exposures. Supervised by Professor Cristel Pelsser, Associate Professor Antoine Gallais and Associate Professor Pascal Mérindol. This project has been made possible in part by a grant from the Cisco University Research Program Fund.
- Jan-Aug 2018 [Final-year internship](#) ICube, France  
Study of BGP blackholing as an attack vector. Supervised by Professor Cristel Pelsser and Associate Professor Stéphane Catelein.
- May-Jul 2017 [Research internship](#) ICube, France  
Development of a BGP routing data analyser. Supervised by Professor Cristel Pelsser.
- Jan-May 2017 [Research project](#) ICube, France  
Security in the Internet of Things. Study of common IoT network protocols and how each layer of the stack is secured. Supervised by Associate Professor Antoine Gallais.
- May-Jul 2016 [Research internship](#) ICube, France  
Development of an IGP routing data analyser (includes an algorithm that computes the shortest paths in every network state generated by the analyser). Supervised by Associate Professor Pascal Mérindol.

## Publications

- Jan 2022 [Finding \(s,d\)-Hypernetworks in F-Hypergraphs is NP-Hard](#) arXiv  
Reynaldo Gil Pons, Max Ward and Loïc Miller. In arXiv preprint arXiv:2201.04799.
- Dec 2021 [Securing Workflows Using Microservices and Metagraphs](#) MDPI  
Loïc Miller, Pascal Mérindol, Antoine Gallais and Cristel Pelsser. In MDPI Special Issue Advances in Communications Software and Services (MDPI).
- Jun 2021 [Towards Secure and Leak-Free Workflows Using Microservice Isolation](#) HPSR  
Loïc Miller, Pascal Mérindol, Antoine Gallais and Cristel Pelsser. In International Conference on High-Performance Switching and Routing (HPSR 2021), Paris.
- Jun 2021 [Verification of Cloud Security Policies](#) HPSR  
Loïc Miller, Pascal Mérindol, Antoine Gallais and Cristel Pelsser. In International Conference on High-Performance Switching and Routing (HPSR 2021), Paris.
- Sep 2019 [A Taxonomy of Attacks using BGP Blackholing](#) ESORICS  
Loïc Miller and Cristel Pelsser. In European Symposium on Research in Computer Security (ESORICS 2019), (pp. 107-127), Luxembourg.



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## Talks

- Sep 2021 [Protection contre les fuites de données: un environnement micro-services sécurisé](#) [CoRes](#)  
Loïc Miller, Pascal Mérindol, Antoine Gallais and Cristel Pelsser. In 6ème Rencontres Francophones sur la Conception de Protocoles, l'Evaluation de Performance et l'EXpérimentation des Réseaux de Communication (CoRes 2021), La Rochelle.
- Sep 2021 [De l'Utilisation des Métagraphes pour la Vérification de Politiques de Sécurité](#) [AlgoTel](#)  
Loïc Miller, Pascal Mérindol, Antoine Gallais and Cristel Pelsser. In 23ème Rencontres Francophones sur les Aspects Algorithmiques des Télécommunications (AlgoTel 2021), La Rochelle.
- Aug 2021 [Policy Verification Using Metagraphs](#) [FOSAD](#)  
Loïc Miller, Pascal Mérindol, Antoine Gallais and Cristel Pelsser. In XX International School on Foundations of Security Analysis and Design (FOSAD 2021), Bertinoro, Italy.
- Jun 2021 [Towards Secure and Leak-Free Workflows Using Microservice Isolation](#) [HPSR](#)  
Loïc Miller, Pascal Mérindol, Antoine Gallais and Cristel Pelsser. In International Conference on High-Performance Switching and Routing (HPSR 2021), Paris.
- Jun 2021 [Verification of Cloud Security Policies](#) [HPSR](#)  
Loïc Miller, Pascal Mérindol, Antoine Gallais and Cristel Pelsser. In International Conference on High-Performance Switching and Routing (HPSR 2021), Paris.
- Oct 2019 [Securing Workflows using Microservices](#) [University of Strasbourg](#)  
Loïc Miller, Pascal Mérindol, Antoine Gallais and Cristel Pelsser. Poster and presentation at the poster days of the Doctoral School, Strasbourg, France.
- Sep 2019 [A Taxonomy of Attacks using BGP Blackholing](#) [ESORICS](#)  
Loïc Miller and Cristel Pelsser. In European Symposium on Research in Computer Security (ESORICS 2019), Luxembourg.
- Jun 2019 [Securing Workflows using the Microservices Architecture](#) [TMA](#)  
Loïc Miller, Pascal Mérindol, Antoine Gallais and Cristel Pelsser. Poster at the Network Traffic Measurement and Analysis conference (TMA 2019), Paris, France.
- Jan 2019 [BGP Blackholing Attack Defense](#) [RESCOM](#)  
Loïc Miller and Cristel Pelsser, Stéphane Cateloin. In Journées non-thématiques RESCOM (RESCOM 2019), Grenoble, France.



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## Teaching

- Jan-Apr 2022 [Inter-domain Routing](#) University of Strasbourg  
First year master's students; One lab work group (TP); 14hrs. Fundamental inter-domain routing concepts, BGP, MPLS, VPNs; using the [mini-Internet project](#).
- Jan-Aug 2020 [Study and Research Work](#) University of Strasbourg  
Two first year master's students (tutoring). Introduction to research, reading articles, presenting results.
- Sep-Dec 2019 [Computer Architecture Basics](#) University of Strasbourg  
Second year undergraduate students; One work group (TD) and two lab work groups (TP); 34hrs. Introduction to computer architecture. Machine code and C programming.
- Sep-Dec 2019 [Data Structures and Algorithms 1](#) University of Strasbourg  
Second year undergraduate students; One work group (TD); 22hrs. Specifying and programming basic data structures and algorithms. C programming.
- Jan-May 2019 [Data Structures and Algorithms 2](#) University of Strasbourg  
Second year undergraduate students; Two lab work groups (TP); 24hrs. Specifying and programming data structures and algorithms. C programming.
- Sep-Dec 2018 [Computer Science Culture and Practice](#) University of Strasbourg  
First year undergraduate students; Two lab work groups (TP); 28hrs. How to interact with the Operating System, shell basics, shell scripts.

## Related Activities

- Reviews for:
  - [Passive and Active Measurement](#).
  - [ACM Internet Measurement Conference](#).
  - [International Conference on emerging Networking EXperiments and Technologies](#).
- Organization of team workshop to present articles.
- Web chair for IMC22.

## Skills

- Languages: Python, Shell, C, Java, C++, SQL.
- Networking: IPv4/v6, routing (BGP, OSPF, RIP), MPLS, Ethernet, VLAN, TCP/IP.
- System: Linux, Windows, MySQL, monitoring.
- Security: authentication, authorization, policy, firewall, iptables, proxy, cryptography.